SAS to SAS/SATA JBOD Subsystem

User Manual

Revision 1.0

Table of Contents

Chapter 1 Introduction 3
1.1 Features 4
1.2 Technical Specifications 5
1.3 Unpacking the JBOD Expansion Chassis 6
1.4 Identifying Parts of the Expansion Chassis 7
1.4.1 Front View 7
1.4.2 Rear View 8
1.4.3 JBOD Controller Module 9
1.4.3.1 JBOD Controller Panel 9
1.5 Power Supply / Fan Module (PSFM) 10
1.5.1 PSFM Panel 10
1.5.2 Power Supply Module LED 11
1.6 LCD Display Panel 12
1.6.1 LCD Panel LED 12
1.6.2 LCD Panel Function Buttons 13
1.6.3 Menu Diagram 14
1.7 Drive Carrier Module 15
1.7.1 Disk Drive Status Indicators 15
1.7.2 Drive Carrier Lock Indicator 16

Chapter 2 Installation of JBOD Subsystem 17
2.1 Powering On 17
2.2 Disk Drive Installation 18
2.2.1 Installing Disk Drive in a Disk Tray 18
2.2.2 Installing 2.5" Disk Drive in a Disk Tray 21
2.2.3 Installing a SATA Disk Drive (Dual Controller Mode) in a Disk Tray 23
2.2.4 Installing 2.5" SATA Disk Drive (Dual Controller Mode) in a Disk Tray 27
2.3 Connecting the JBOD Subsystem 31
2.3.1 Connecting to SAS HBA 31
2.3.2 Connecting to RAID Subsystem 31

Chapter 3 Maintenance 32
3.1 Upgrading the JBOD Controller's Firmware 32
3.2 Replacing Subsystem Components 36
3.2.1 Replacing JBOD Controller Module 36
3.2.1.1 Replacing JBOD Controller Module with Blanking Plate 37
3.2.2 Replacing Power Supply Fan Module 38
3.2.2.1 Replacing Power Supply Fan Module with Blanking Plate 39

Chapter 1 Introduction

The Expansion Chassis

The JBOD subsystem is a 19-inch 4U rackmount JBOD unit with optimized solutions for servers and external storage systems. It features the latest SAS 3.0 12Gb/s interface and designed to fit in with the environments which needed highly reliable and relentless data growth.

The JBOD subsystem incorporates the latest enhancements in SAS along with LSI DataBolt bandwidth optimizer technology (EDFB, End Device Frame Buffering). Using DataBolt, it delivers optimized throughput by allowing users to gain 12Gb/s host speeds with current-generation 6Gb/s drives. It is also a versatile SAS3 / SATA3 disk expansion system, ideal for high capacity and scalability storage in IT demands. It also supports dual JBOD controllers which provide better fault tolerance and higher reliability of system operation. The JBOD subsystem offers GUI management to monitor enclosure environmental conditions through a remote connection.

1.1 Features

Highest Density Available

- 4U chassis with 24 bays carriers
- Support the 2.5” / 3.5" enterprise class SAS3 / SATA3 disk drives or SSD drives

High Availability

- Single or dual SAS JBOD controller module
- Each SAS JBOD controller module consist of four 4x mini SAS HD ports
- Utilizes LSI DataBolt bandwidth optimizer technology

Power Supply

- Power supply and cooling system contained in 1 module for efficient cooling
- Two 500W redundant hot swappable power supplies

Enclosure

- Incorporates a cableless design for maximum signal integrity
- Utilizes industry-standard SCSI enclosure services to monitor enclosure and disk environmental conditions

Enclosure monitoring

- S.E.S. support for standard enclosure management
- System LED indications
- Fan speed monitoring
- Power supply monitoring
- System voltage monitoring
- System temperature monitoring
- System alarm

1.2 Technical Specifications

RAID Controller	JBOD
JBOD Controller	Single / Redundant
Host Interface	Two / Four 4x mini SAS HD (12Gb/s)
Disk Interface	12Gb/s SAS, 6Gb/s SATA
SAS expansion	Two / Four 4x mini SAS HD (12Gb/s)
Enclosure	
Platform	Rackmount
Form Factor	4U
# of Hot Swap Trays	24
Disk Status Indicator	Access / Fail LED
Backplane	SAS / SATA BP
# of PS/Fan Modules	500W x 2 w/PFC
# of Fans	4
Power requirements	AC 90V ~ 264V Full Range, 10A ~ 5A, 47Hz ~ 63Hz
Environmental	
Relative Humidity	10% ~ 85% Non-condensing
Operating Temperature	10°C ~ 40°C (50°F ~ 104°F)
Physical Dimension	607(L) x 482 (W) x 176(H) mm
Weight (Without Disk)	26.5 / 27.5Kgs

Specification is subject to change without notice.
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1.3 Unpacking the JBOD Expansion Chassis

The shipping package contains the following:

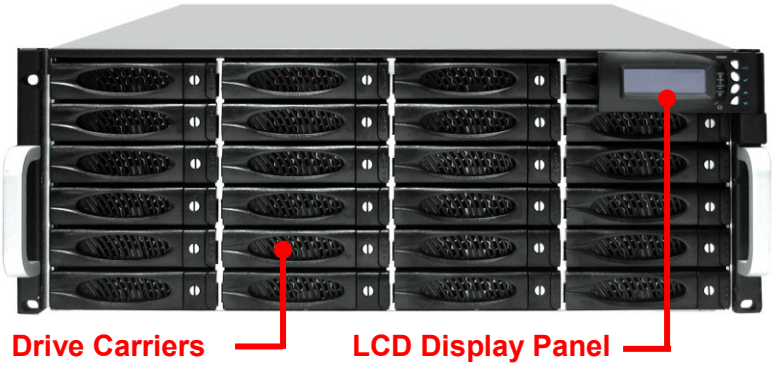
	JBOD Subsystem Unit
	Two (2) power cords
	One (1) external serial cable RJ11-to-DB9 for single JBOD controller Two (2) serial cables for dual JBOD controllers
	One (1) mini SAS HD cable for single JBOD controller Two (2) mini SAS HD cables for dual JBOD controllers
	One (1) Ethernet LAN cable for single JBOD controller Two (2) Ethernet LAN cables for dual JBOD controllers
	One(1) JBOD Controller Blanking Plate Note: For dual JBOD controllers
	One(1) PSFM Blanking Plate
	User Manual

NOTE: If any damage is found, contact the dealer or vendor for assistance.

1.4 Identifying Parts of the Expansion Chassis

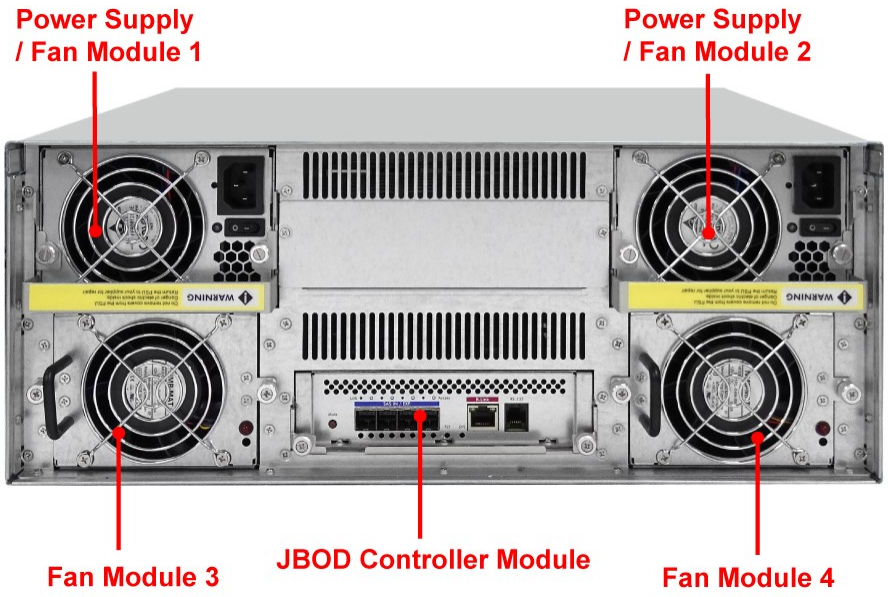
The illustrations below identify the various parts of the expansion chassis.

1.4.1 Front View

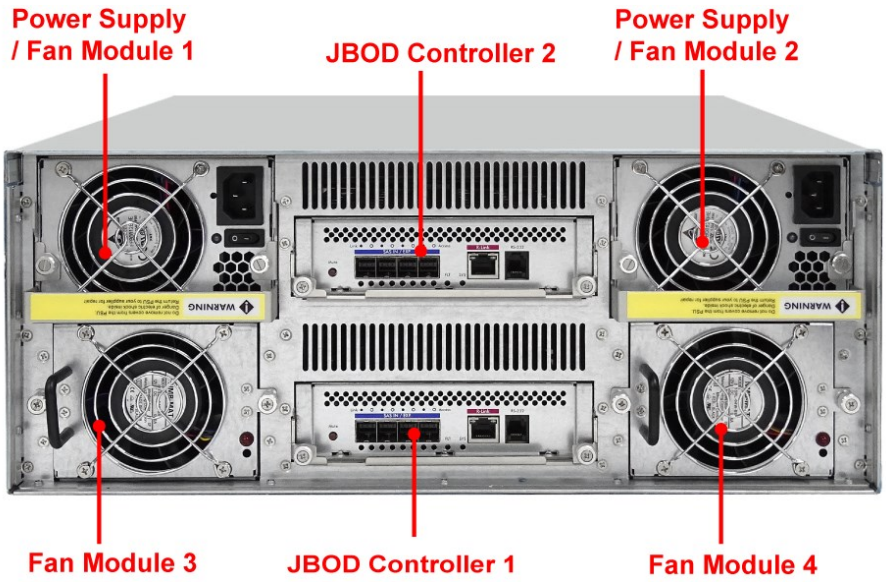


1.4.2 Rear View

Single Controller

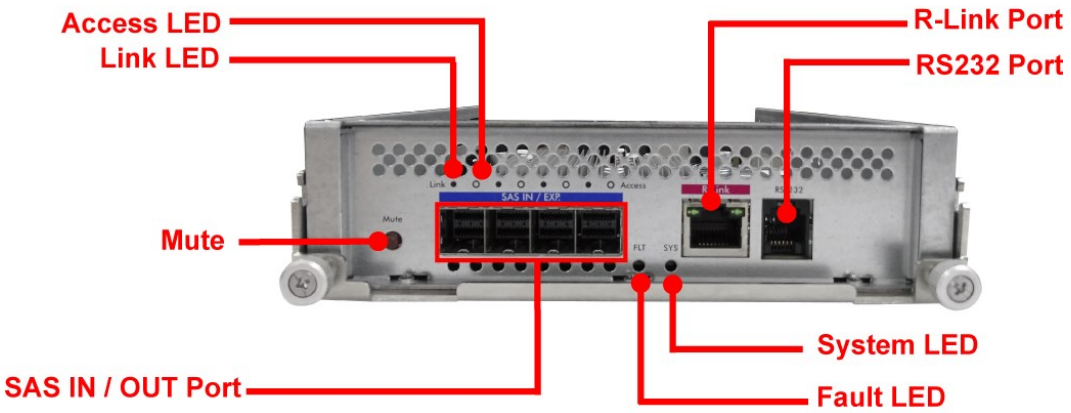


Dual Controller



1.4.3 JBOD Controller Module

1.4.3.1 JBOD Controller Panel



NOTE: SAS IN/OUT Port can be flexibly configured as either SAS IN PORT or SAS OUT PORT by customer's request

SAS IN Port: SAS cable must be connected to this port and to the SAS HBA, or other Expansion Chassis's SAS Expansion Port, if this chassis is connected in daisy-chain.

SAS OUT Port: SAS cable must be connected to these ports and to other SAS IN Port of other expansion chassis for daisy-chaining.

Link LED (SAS IN and SAS OUT): Green indicates SAS IN/OUT Port has connected or linked.

Access LED (SAS IN and SAS OUT): Blue indicates SAS IN/OUT Port is being accessed.

RS-232 Port: Used for upgrading the Firmware of JBOD controller in the Expansion Chassis.

Mute: Use this button to silence the alarm beeper. If another failure event happens, the alarm beeper will sound again and this button can be pressed again to silence alarm.

System LED: Green indicates Expansion Chassis is Powered On and Ready.

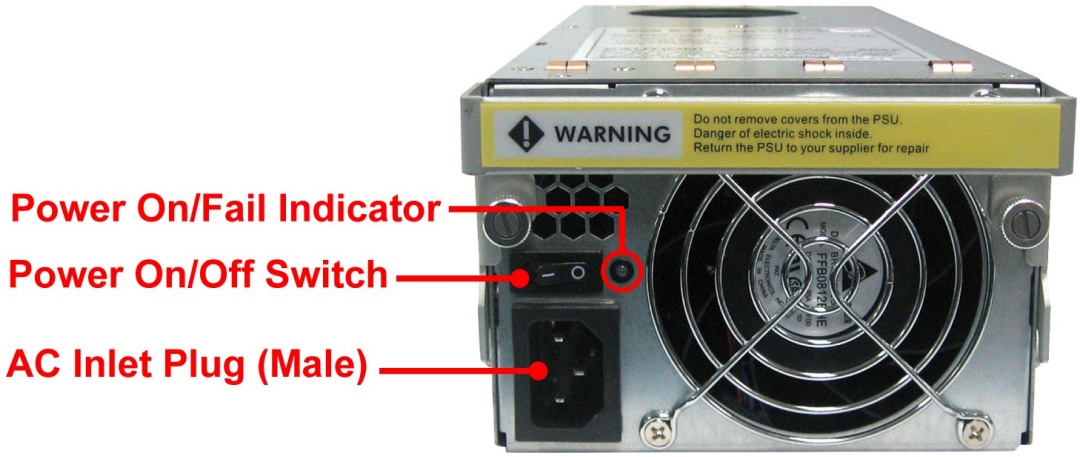
Fault LED: Red (LED is on) indicates there is problem within the Expansion Chassis. If LED is off, the Expansion Chassis is in normal condition.

R-Link Port: Use to connect to Telnet for upgrading the Firmware of JBOD controller

1.5 Power Supply / Fan Module (PSFM)

The JBOD subsystem contains **two 500W Power Supply / Fan Modules**. All PSFMs are inserted into the rear of the chassis.

1.5.1 PSFM Panel


WARNING
Do not remove covers from the PSU.
Danger of electric shock inside.
Return the PSU to your supplier for repair
Power On/Fail Indicator
Power On/Off Switch
AC Inlet Plug (Male)

The Power Supply/Fan Module panel has: Power On/Off Switch, the AC Inlet Plug, and a Power On/Fail Indicator showing the Power Status LED, indicating ready or fail.

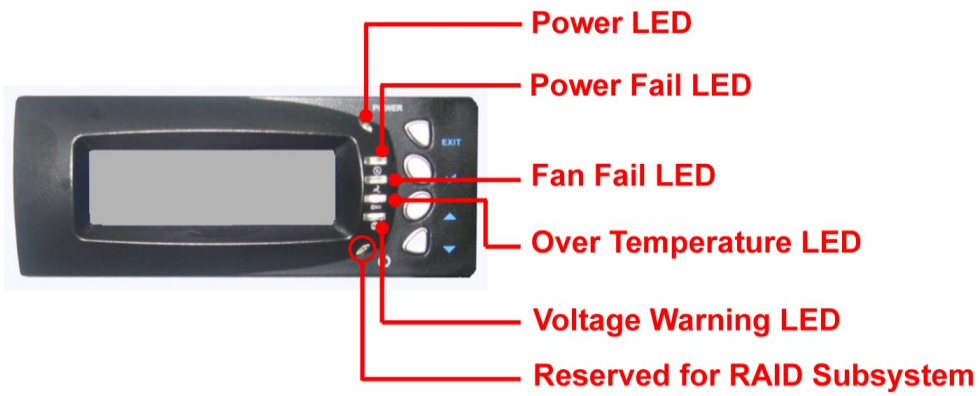
Each fan within a PSFM is powered independently of the power supply within the same PSFM. So if the power supply of a PSFM fails, the fan associated with that PSFM will continue to operate and cool the enclosure.

1.5.2 Power Supply Module LED

When the power cord connected from main power source is inserted to the AC Power Inlet, the power status LED becomes RED. When the switch of the PSFM is turned on, the LED will turn GREEN. When the Power On/Fail LED is GREEN, the PSFM is functioning normally.

1.6 LCD Display Panel

1.6.1 LCD Panel LED

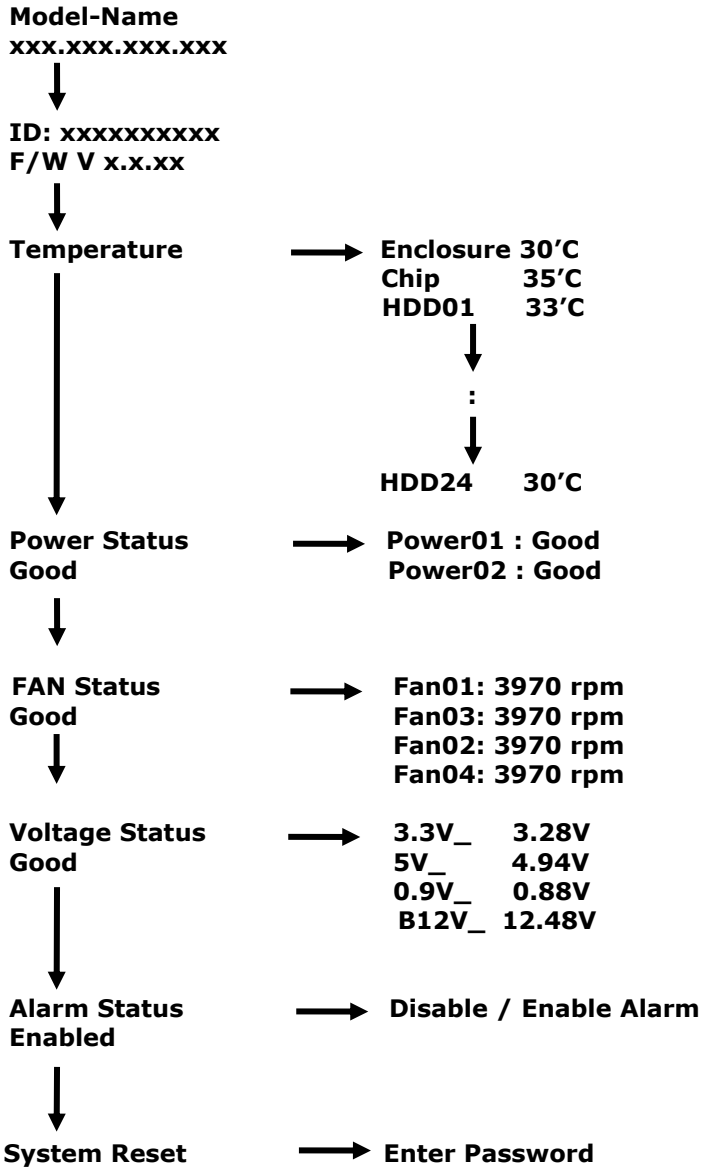


Parts	Function
Power LED	Green indicates power is ON.
Power Fail LED	If one of the redundant power supply unit fails, this LED will turn to RED and alarm will sound.
Fan Fail LED	Turn RED when fan 1 or 2 fails, or speed is lower than 3000 RPM for Master Fan and 2500 RPM for Slave Fan.
Over Temperature LED	If system temperature is over 70°C or disk temperatures exceed 55°C, the Over Temperature LED will turn RED and alarm will sound.
Voltage Warning LED	An alarm will sound if detected voltage in the controller is abnormal and LED will turn RED.

1.6.2 LCD Panel Function Buttons

Parts	Function
Up and Down Arrow buttons ▲ ▼	Use the Up or Down arrow keys to go through the information on the LCD screen. This is also used to move between each menu.
Select button ✔	This is used to enter the option you have selected.
Exit button EXIT	Press this button to return to the previous menu. NOTE: This button can also be used to silence the alarm beeper when in main menu. If you are in submenu and a failure event happens, press the EXIT button few times as necessary to go back to main menu, and press again to silence the alarm.

1.6.3 Menu Diagram



1.7 Drive Carrier Module

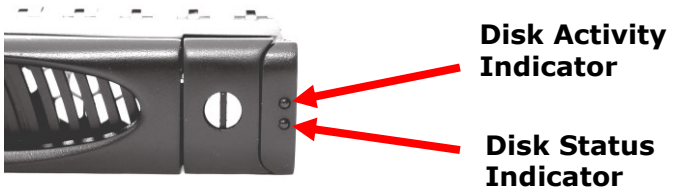
The Drive Carrier Module houses a 3.5 inch hard disk drive. It is designed for maximum airflow and incorporates a carrier locking mechanism to prevent unauthorized access to the HDD.

1.7.1 Disk Drive Status Indicators

Every Drive Carrier has 2 status indicator lights. One indicator light is used for Power On/Error. When this light is **GREEN** the power is on and everything is functioning normally. When the Power On/Error light is **RED**, then an error has happened that requires the user's attention.

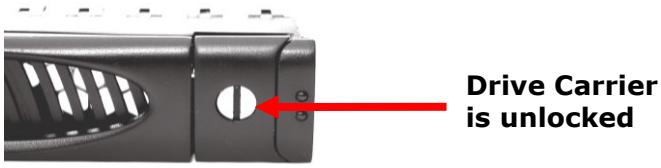
The other status indicator light is the hard disk drive access light. When the hard disk drive is being accessed, this light will flash **BLUE**.

In addition, both indicator lights are viewable within a 170° arc.

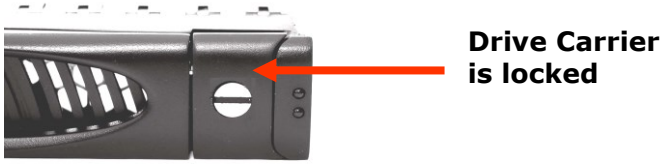


1.7.2 Drive Carrier Lock Indicator

Every Drive Carrier is lockable and is fitted with a lock indicator to indicate whether or not the carrier is locked into the chassis or not. Each carrier is also fitted with an ergonomic handle for easy carrier removal.



When the Lock Groove is vertical, then the Drive Carrier is unlocked.



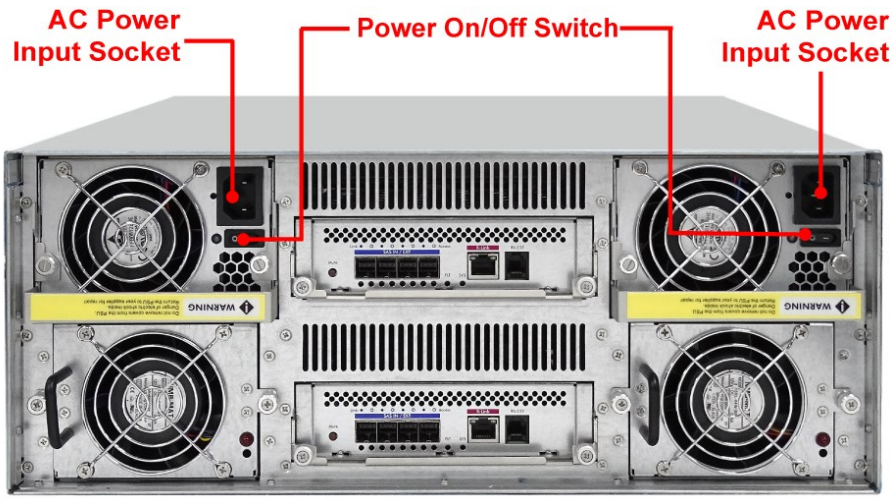
When the Lock Groove is horizontal, this indicates that the Drive Carrier is locked.

Lock and unlock the Drive Carriers by using a flat-head screw driver.

Chapter 2 Installation of JBOD Subsystem

2.1 Powering On

1. Plug in the power cords into the AC Power Input Socket located at the rear of the subsystem.



NOTE: The subsystem is equipped with redundant, full range power supplies with PFC (power factor correction). The system will automatically select voltage.

2. Turn on each Power On/Off Switch to power on the subsystem.

3. The Power LED on the front Panel will turn green.

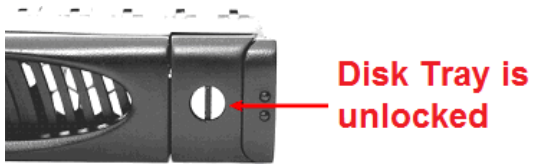
2.2 Disk Drive Installation

This section describes the physical locations of the hard drives supported by the subsystem and give instructions on installing a hard drive. The subsystem supports hot-swapping allowing you to install or replace a hard drive while the subsystem is running.

NOTE: In this model, it is recommended to use 6Gb hard drive disks.

2.2.1 Installing Disk Drive in a Disk Tray

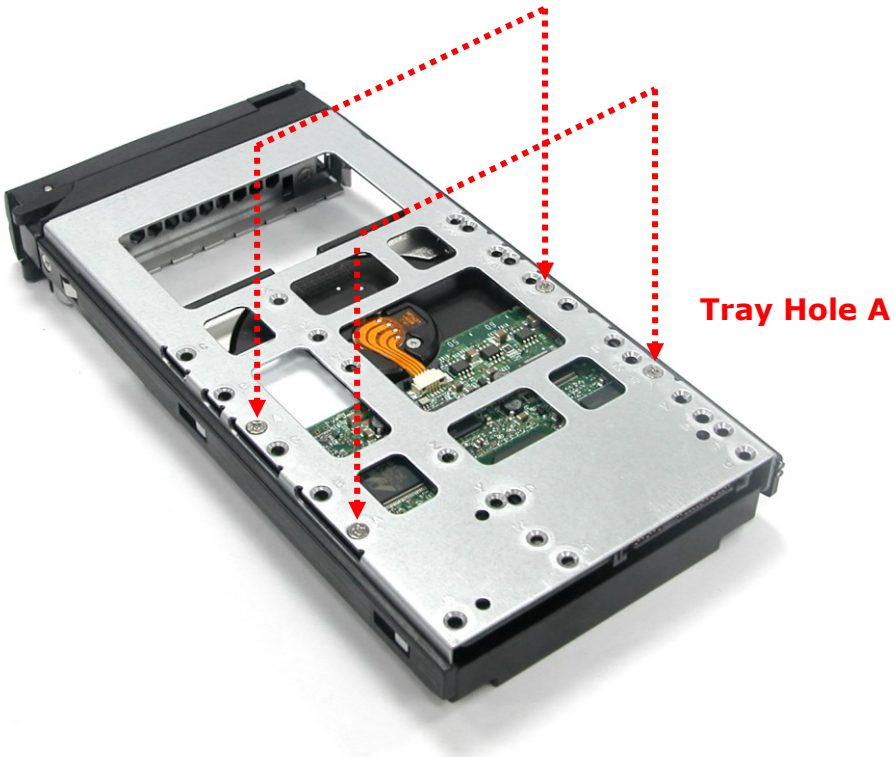
1. Unlock the Disk Trays using a flat-head screw driver by rotating the Lock Groove.



2. Press the Tray Open button and the Disk Tray handle will flip open.

3. Pull out an empty disk tray.

4. Place the hard drive in the disk tray. Turn the disk tray upside down. Align the four screw holes of the SAS disk drive in the four Hole A of the disk tray. To secure the disk drive into the disk tray, tighten four screws on these holes of the disk tray. Note in the picture below where the screws should be placed in the disk tray holes.



NOTE: All the disk tray holes are labelled accordingly.

5. Slide the tray into a slot.

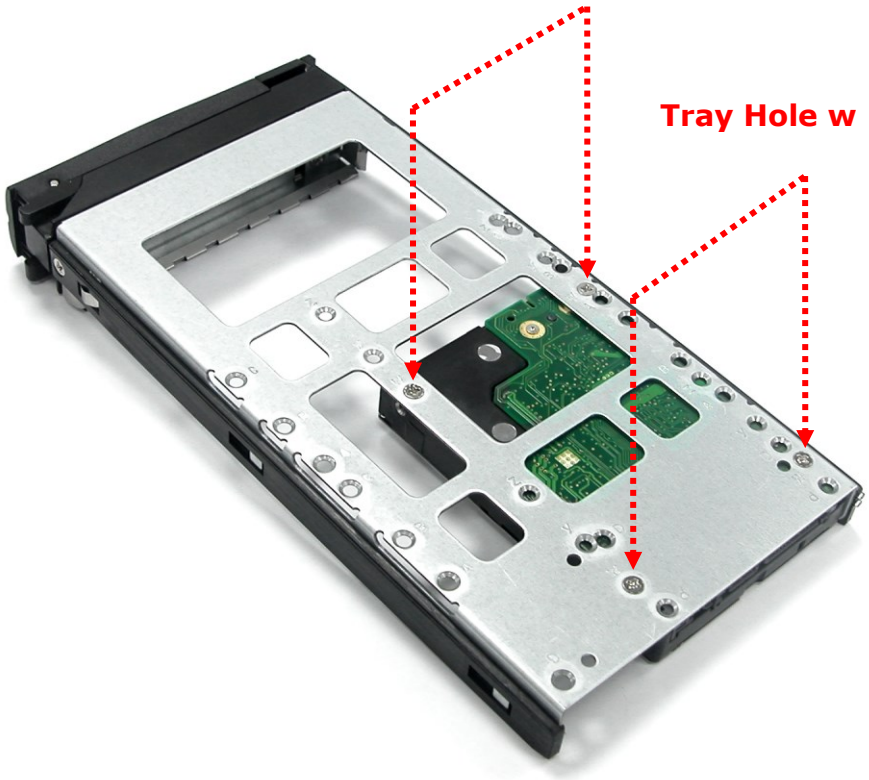
6. Press the lever in until you hear the latch click into place. The HDD Fault LED will turn green when the subsystem is powered on and HDD is good.

7. If necessary, lock the Disk Tray by turning the Lock Groove.

2.2.2 Installing 2.5” Disk Drive in a Disk Tray

1. Remove an empty disk tray from the subsystem.

2. Place the disk drive in the disk tray. Turn the disk tray upside down. Align the four screw holes of the disk drive in the four *Hole w* of the disk tray. To secure the disk drive into the disk tray, tighten four screws on these holes of the disk tray. Note in the picture below where the screws should be placed in the disk tray holes.



NOTE: All the disk tray holes are labelled accordingly.

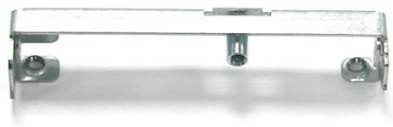
3. Slide the tray into a slot.

4. Press the lever in until you hear the latch click into place. The HDD Fault LED will turn green when the subsystem is powered on and HDD is good.

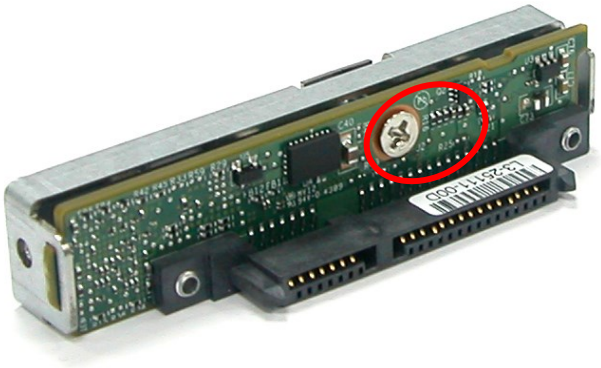
2.2.3 Installing a SATA Disk Drive (Dual Controller Mode) in a Disk Tray

5. Remove an empty disk tray from the subsystem.

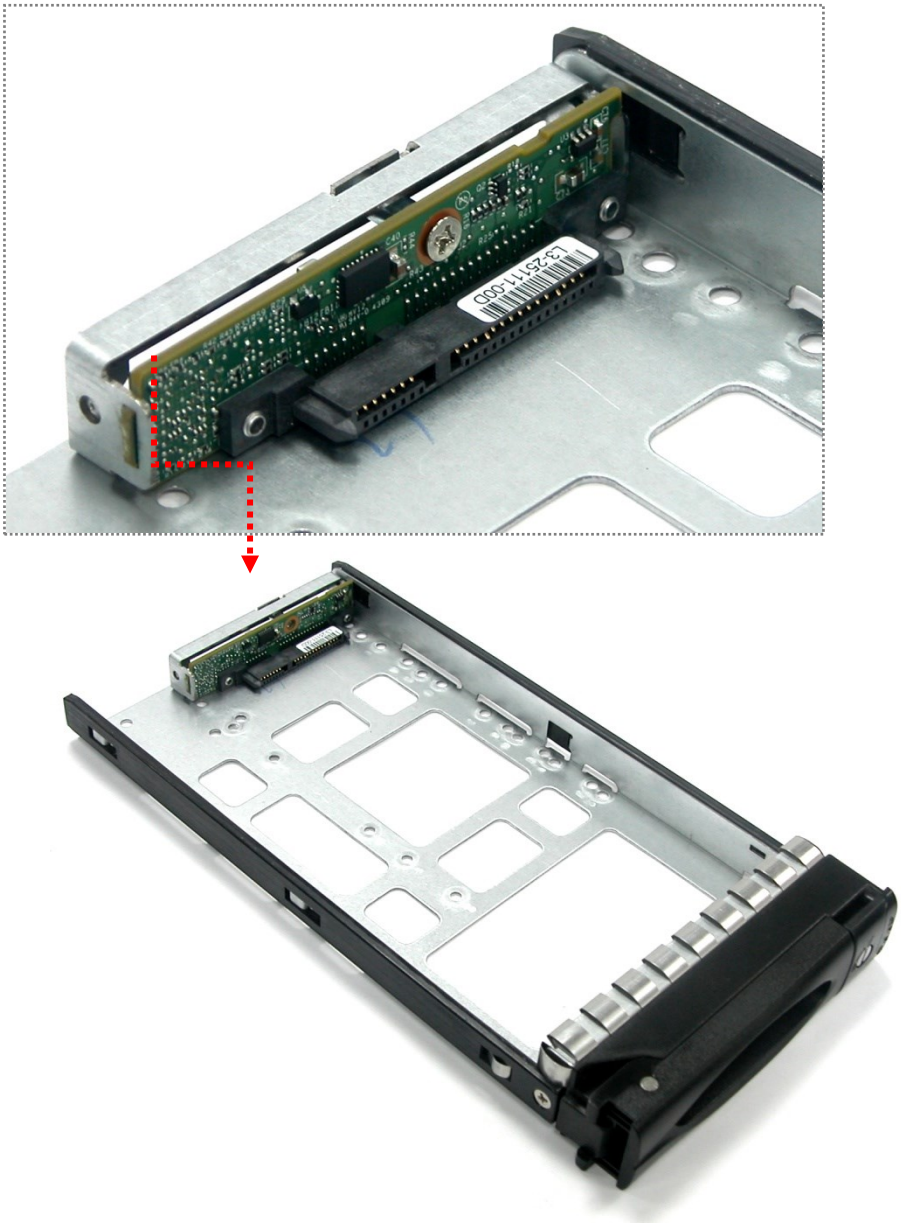
6. Prepare the dongle board, the Fixed Bracket, and screws.

	**Fixed Bracket**
	Dongle Board
	Screws

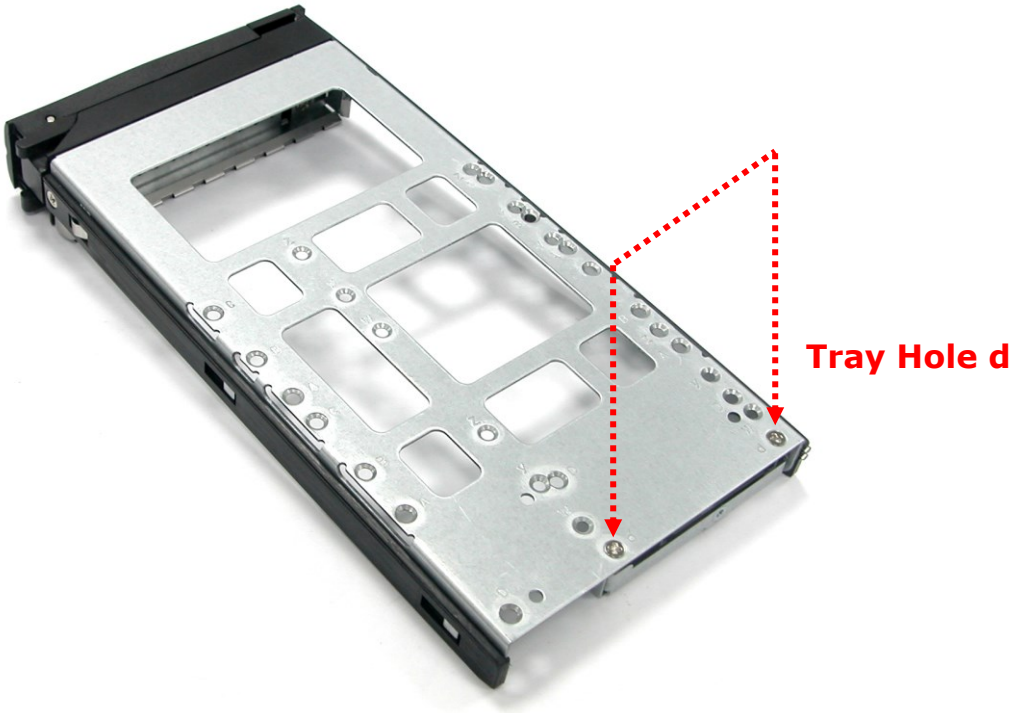
7. Attach the dongle board in the Fixed Bracket with a screw.



8. Place the Fixed Bracket with the dongle board in the disk tray as shown.



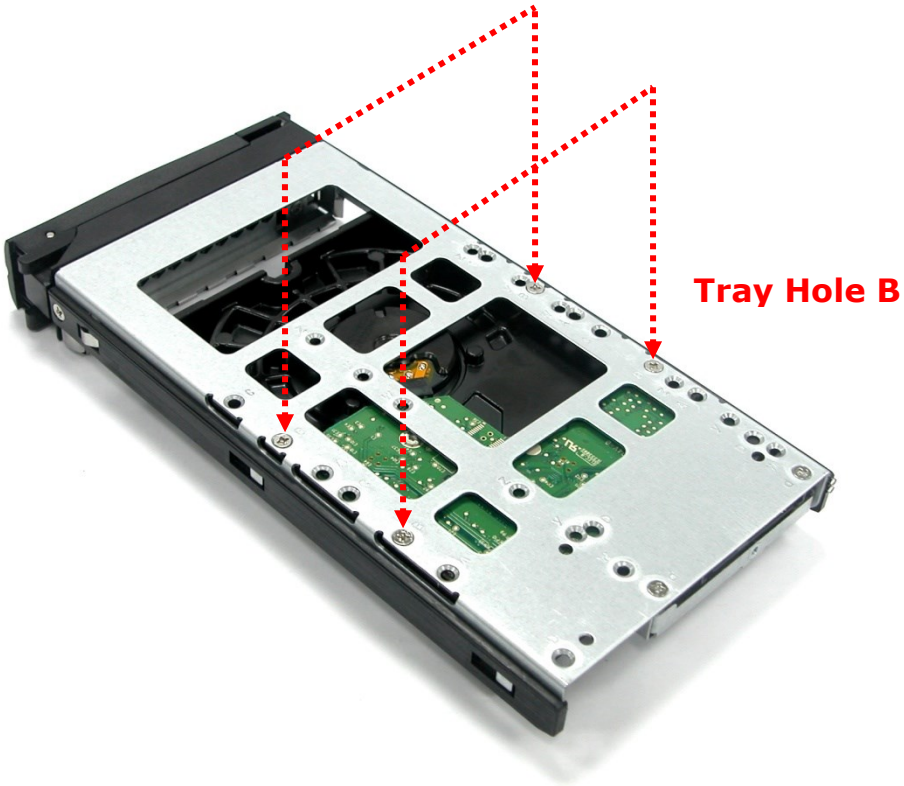
9. Turn the tray upside down. Align the holes of the Fixed Bracket in the two *Hole d* of the disk tray. Tighten two screws to secure the Fixed Bracket into the disk tray.



NOTE: All the disk tray holes are labelled accordingly.

10. Place the SATA disk drive into the disk tray. Slide the disk drive towards the dongle board.

11. Turn the disk tray upside down. Align the four screw holes of the SATA disk drive in the four *Hole B* of the disk tray. To secure the disk drive into the disk tray, tighten four screws on these holes of the disk tray. Note in the picture below where the screws should be placed in the disk tray holes.



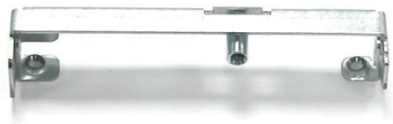
NOTE: All the disk tray holes are labelled accordingly.

12. Insert the disk tray into the subsystem.

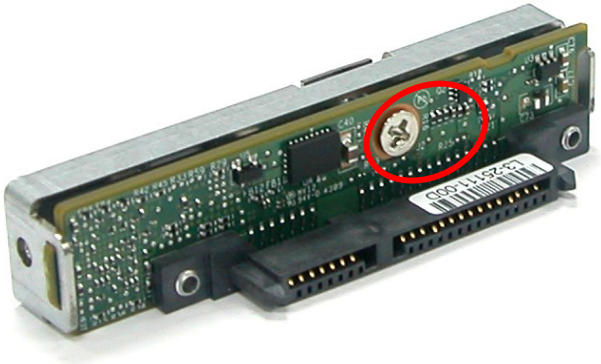
2.2.4 Installing 2.5” SATA Disk Drive (Dual Controller Mode) in a Disk Tray

1. Remove an empty disk tray from the subsystem.

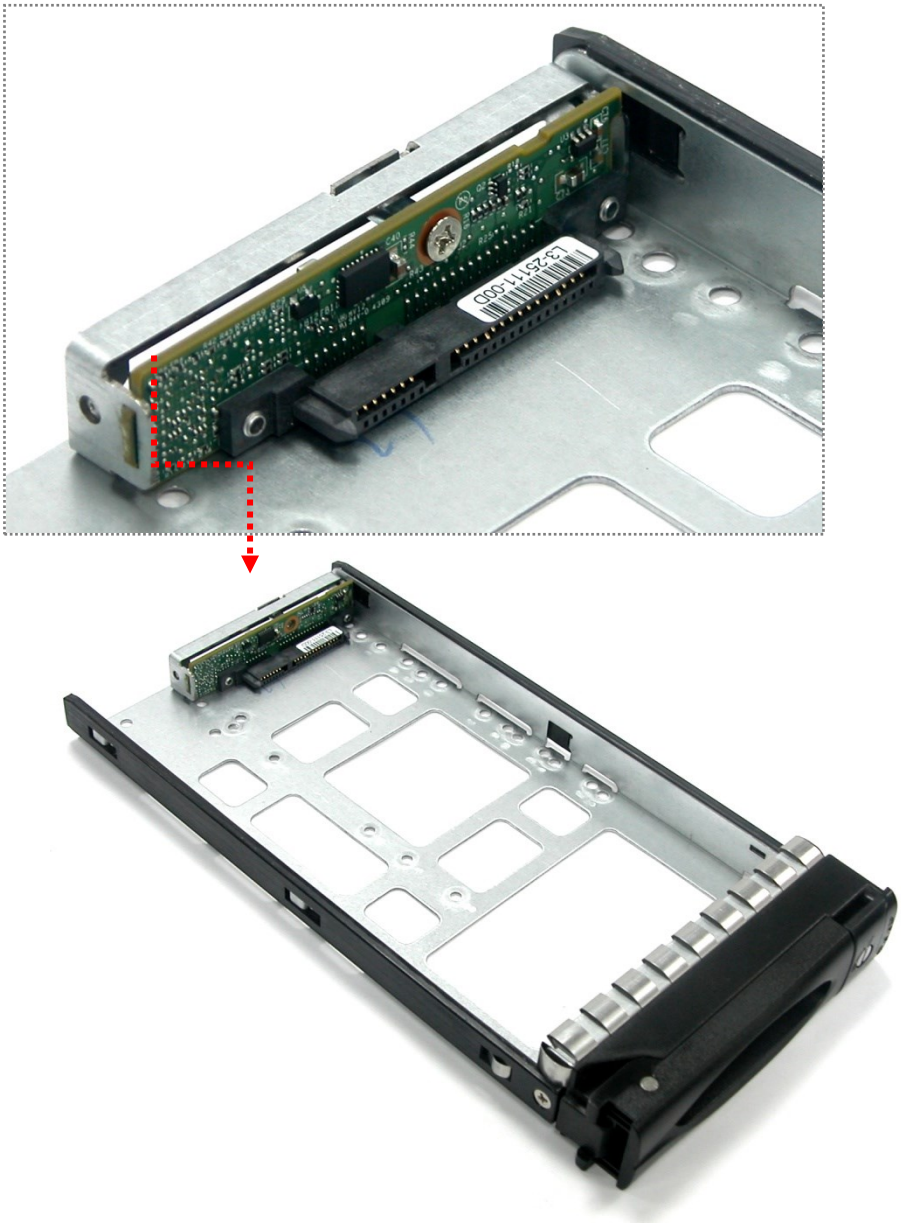
2. Prepare the dongle board, the Fixed Bracket, and screws.

	**Fixed Bracket**
	Dongle Board
	Screws

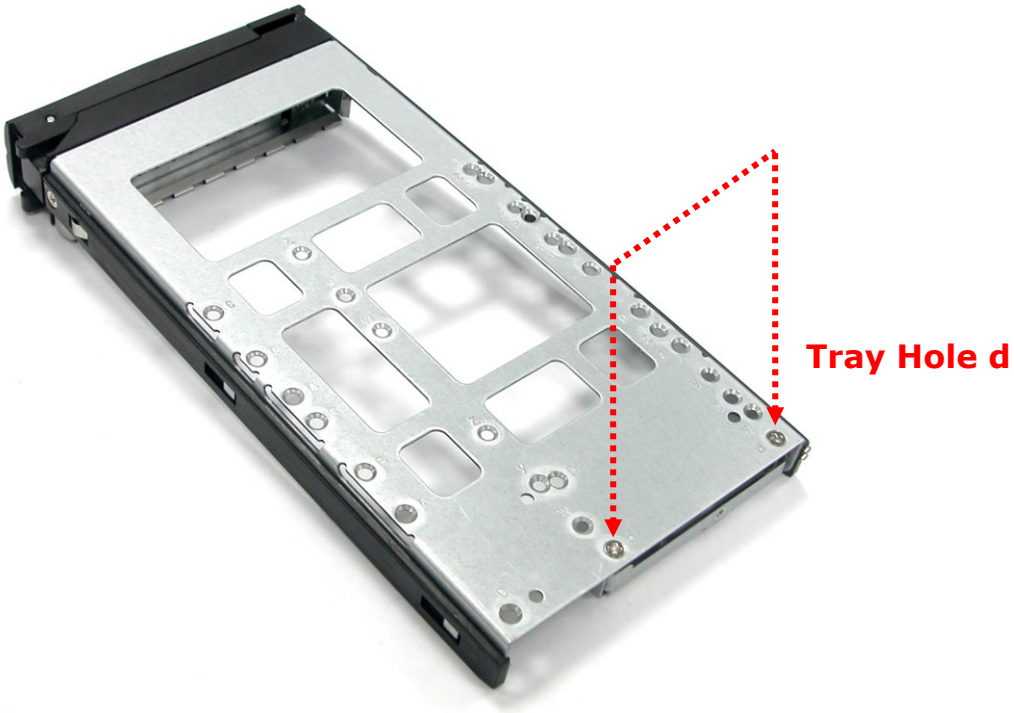
3. Attach the dongle board in the Fixed Bracket with a screw.



4. Place the Fixed Bracket with the dongle board in the disk tray as shown.

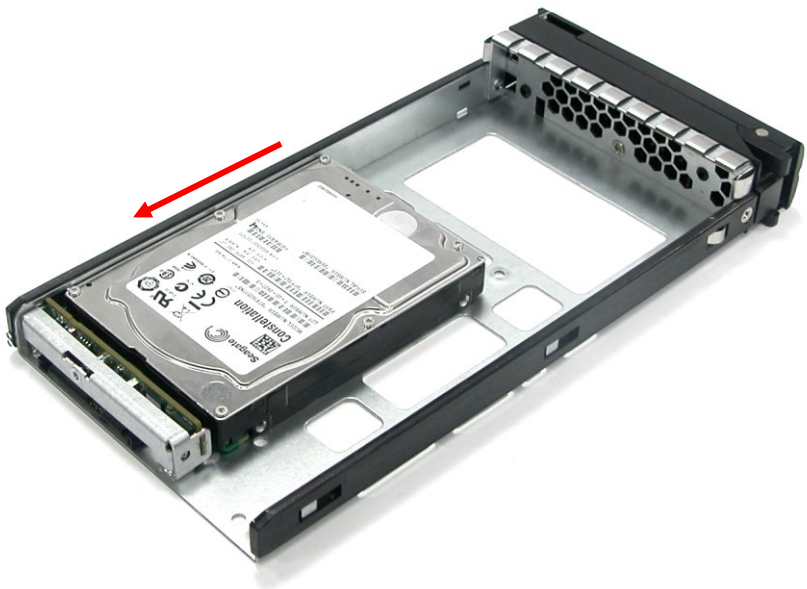


5. Turn the tray upside down. Align the holes of the Fixed Bracket in the two *Hole d* of the disk tray. Tighten two screws to secure the Fixed Bracket into the disk tray.

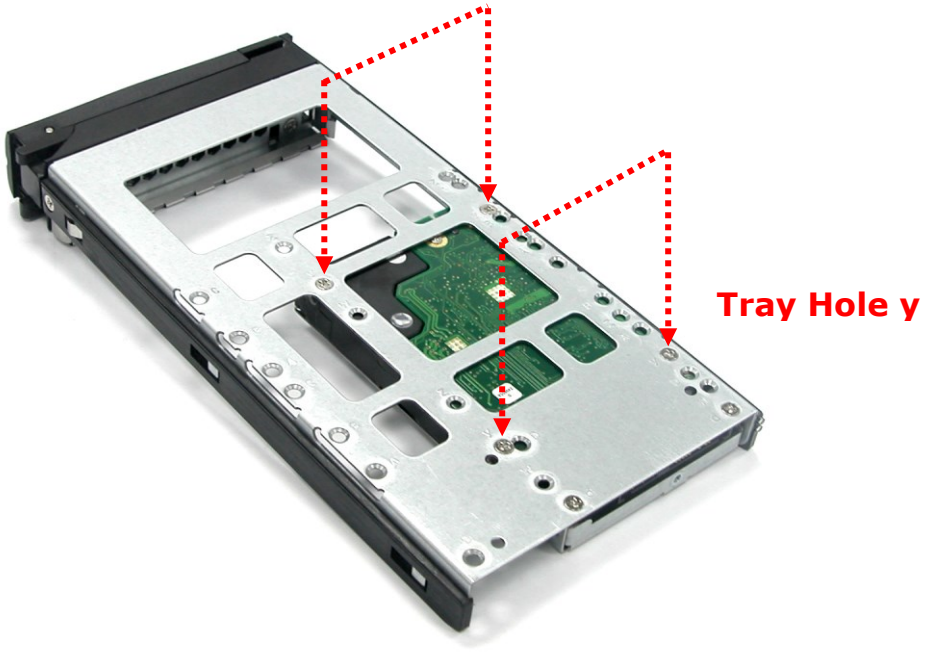


NOTE: All the disk tray holes are labelled accordingly.

6. Place the 2.5” SATA disk drive into the disk tray. Slide the disk drive towards the dongle board.



7. Turn the disk tray upside down. Align the four screw holes of the 2.5” SATA disk drive in the four *Hole y* of the disk tray. To secure the disk drive into the disk tray, tighten four screws on these holes of the disk tray. Note in the picture below where the screws should be placed in the disk tray holes.



NOTE: All the disk tray holes are labelled accordingly.

8. Insert the disk tray into the subsystem.

2.3 Connecting the JBOD Subsystem

2.3.1 Connecting to SAS HBA

The JBOD Subsystem supports SAS interface which provides fast 600MB data transfer rate using SAS phy. Attach one end of the SAS cable to the SAS IN Port and the other end to the host bus adapter's (HBA) external SAS connector or to the SAS Switch. (The host bus adapter is installed in your Host computer system.)

2.3.2 Connecting to RAID Subsystem

Attach one end of the SAS cable to the SAS IN Port of the JBOD controller module and the other end to the SAS Expansion Port on the RAID controller of RAID subsystem. If configured in redundant mode, connect the other SAS cable to the SAS IN Port of the other JBOD controller, and the other end to the SAS Expansion Port on the other RAID controller of RAID subsystem.

Chapter 3 Maintenance

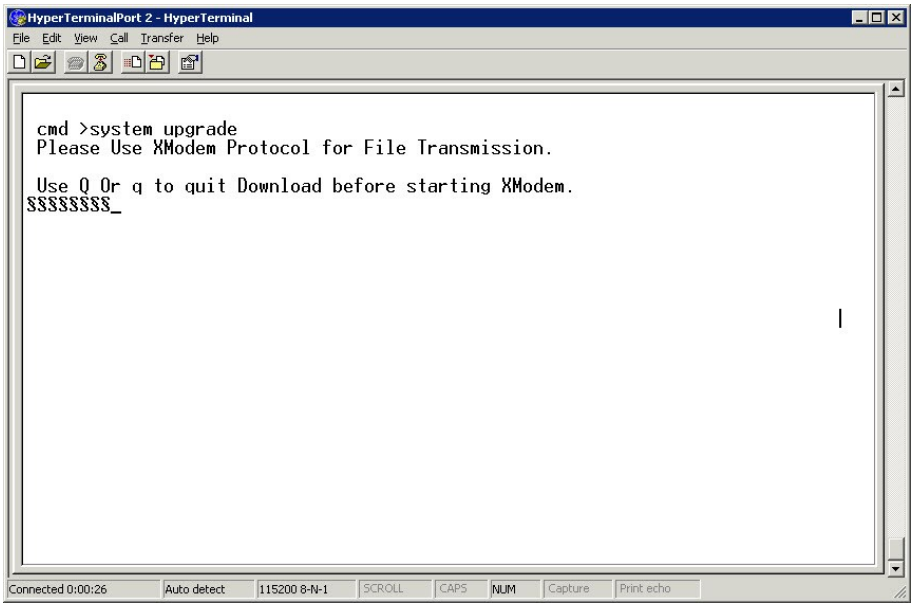
3.1 Upgrading the JBOD Controller's Firmware

IMPORTANT: Before upgrade the JBOD firmware, please shut down server first or make sure no array setting on the JBOD disks. The new Firmware will effective after JBOD power cycle.

NOTE: Upgrading the firmware must be done from Master JBOD Controller (JBOD Controller 1) if the JBOD Subsystem has redundant JBOD Controllers.

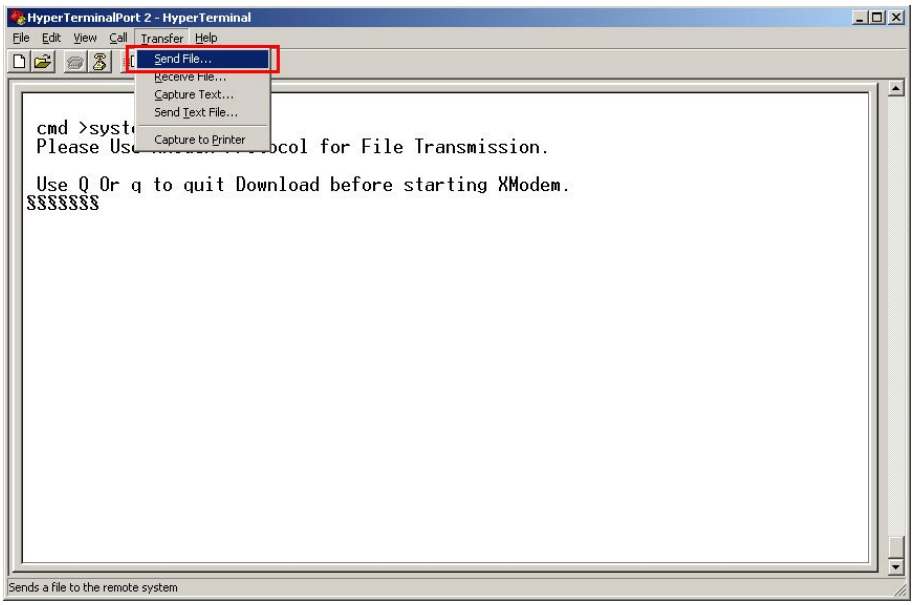
Steps:

1. Please use the RS232 cable (Phone jack to DB9) to JBOD Controller #1 and to connect JBOD RS232 Port and PC COM1 Port (or change to other COM Port as necessary).
2. Open Windows HyperTerminal Program. Connect using COM1 (COM Port used in Step1), Baud Rate: 115200, n, 8, 1, Flow Control: None.
3. Please type "system upgrade", than press "Enter" in command line.

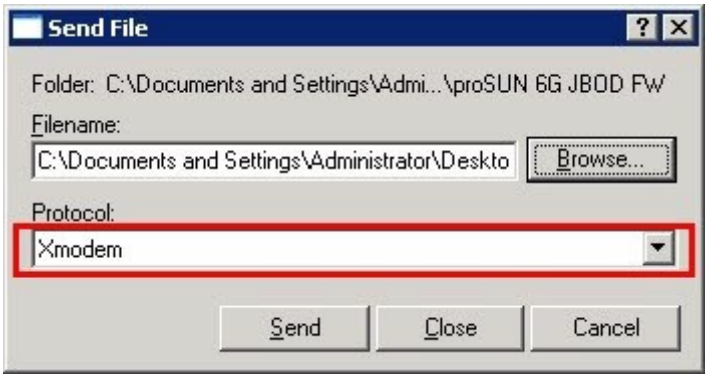


4. Select Transfer & Send File.

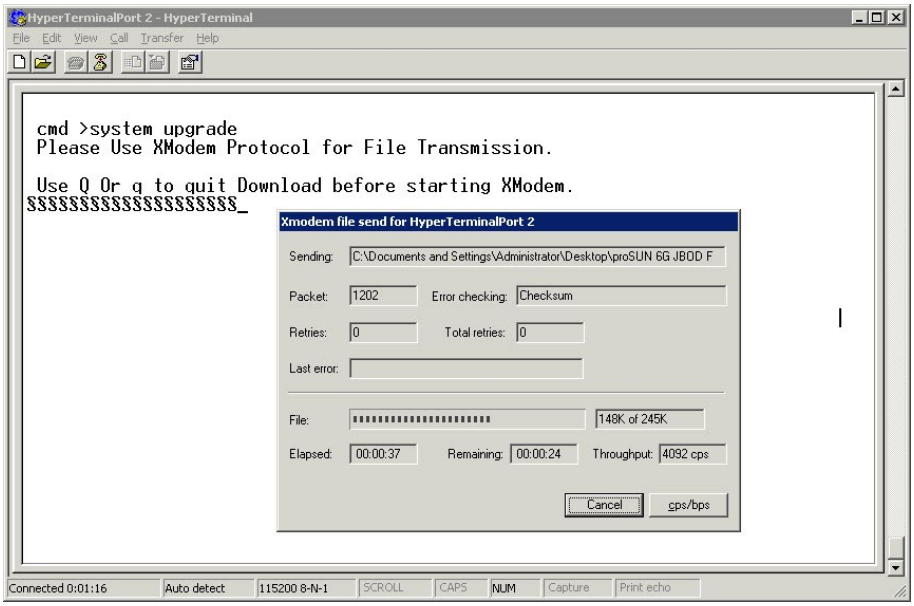
   You must finish within 25 seconds

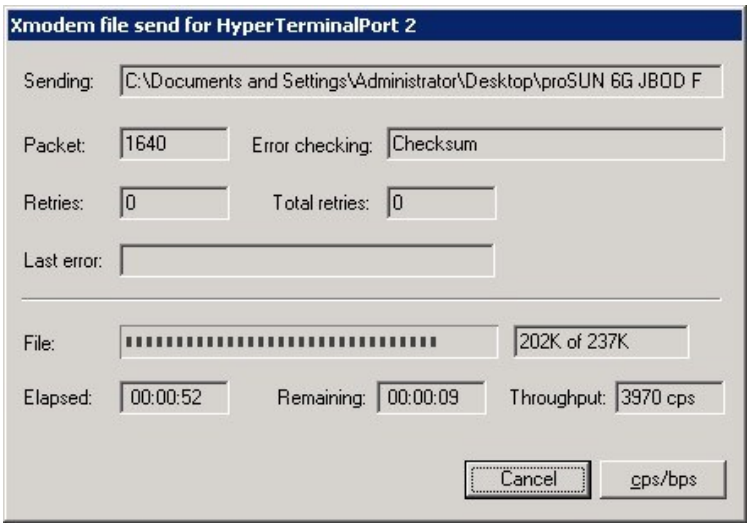

HyperTerminalPort 2 - HyperTerminal
File Edit View Call Transfer Help
Send File...
Receive File...
Capture Text...
Send Text File...
Capture to Printer
Use Q Or q to quit Download before starting XModem.
Sends a file to the remote system

5. Select your firmware file path, and select Xmodem in the communication protocol, and click transfer button.

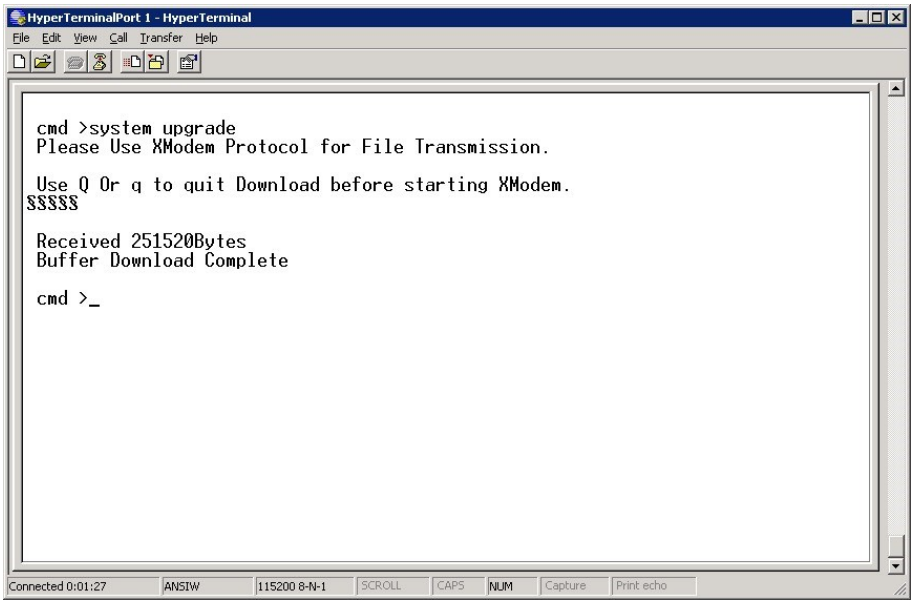


6. Wait for the transfer of file to complete.

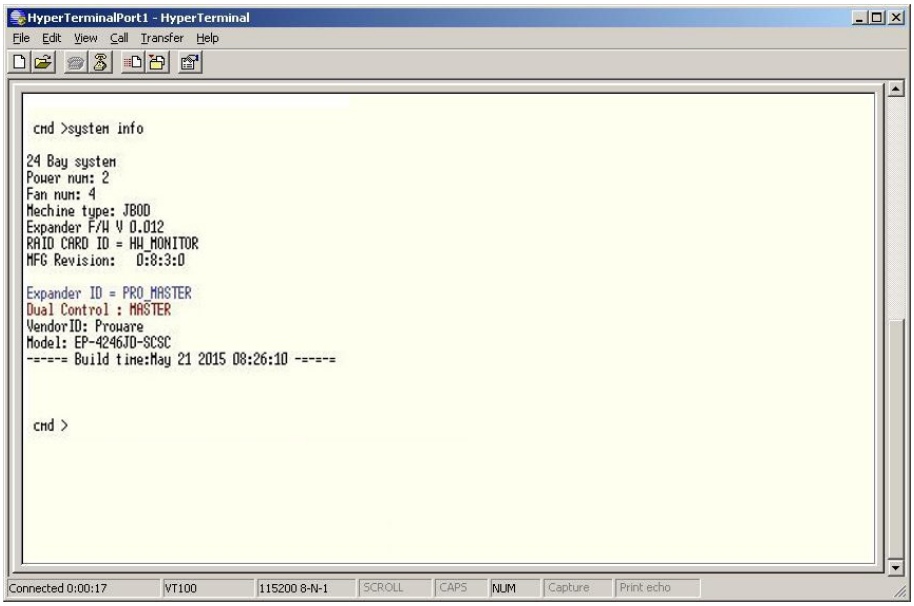

HyperTerminalPort 2 - HyperTerminal
File Edit View Call Transfer Help
cmd >system upgrade
Please Use XModem Protocol for File Transmission.
Use Q Or q to quit Download before starting XModem.
CCCCCCCCCCCCCCCCCCCCCCC
Xmodem file send for HyperTerminalPort 2
Sending: C:\Documents and Settings\Administrator\Desktop\proSUN 6G JBOD F
Packet: 1202 Error checking: Checksum
Retries: 0 Total retries: 0
Last error:
File: 148K of 245K
Elapsed: 00:00:37 Remaining: 00:00:24 Throughput: 4092 cps
Cancel cps/bps
Connected 0:01:16 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo


Xmodem file send for HyperTerminalPort 2
Sending: C:\Documents and Settings\Administrator\Desktop\proSUN 6G JBOD F
Packet: 1640 Error checking: Checksum
Retries: 0 Total retries: 0
Last error:
File: 202K of 237K
Elapsed: 00:00:52 Remaining: 00:00:09 Throughput: 3970 cps
Cancel cps/bps

7. When the transfer and firmware update is complete, please power cycle the JBOD.



8. In command line, type "system info", you can see the Expander firmware version.

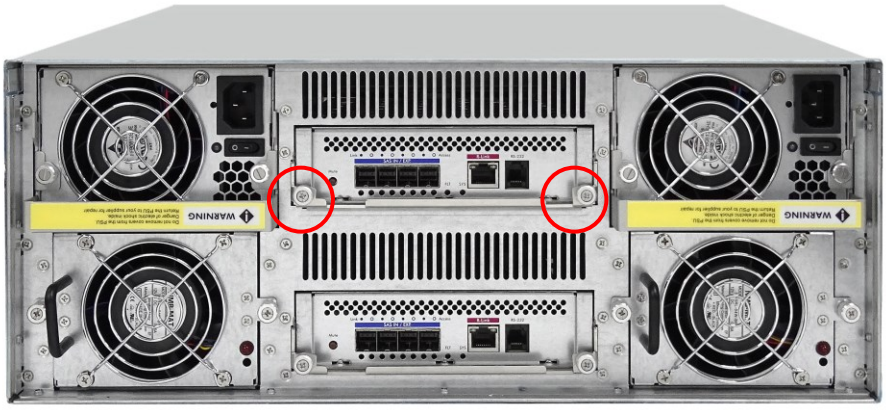


3.2 Replacing Subsystem Components

3.2.1 Replacing JBOD Controller Module

When replacing a failed JBOD Controller Module, please follow these steps:

1. Make sure the subsystem is in power off state. Loosen the thumbscrews on the sides of the Controller Module case.
2. Use the Controller handle to pull out the defective Controller.
3. Insert and slide the new Controller in. Note that it may be necessary to remove the old/defective Controller Module from the case and install the new one.
4. Tighten the thumbscrews on the sides of the Controller Module case.

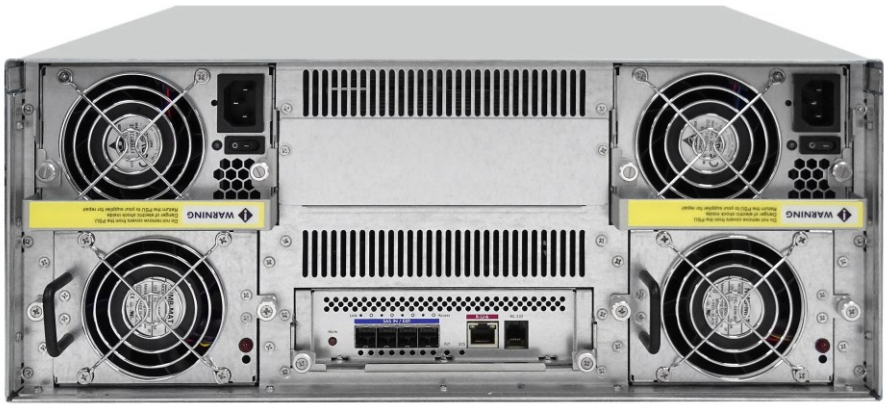


3.2.1.1 Replacing JBOD Controller Module with Blanking Plate

When replacing a failed Controller Module with Blanking Plate, please follow these steps:

1. Loosen thumbscrews of the failed Controller Module.
2. Use the Controller Module handle to remove the failed Controller Module from the subsystem.
3. Insert the Controller Blanking Plate included in your package.

4. Tighten the screws of the Blanking Plate.



When replacing a failed component online, it is not recommended to remove the failed component for a long period of time; proper air flow within the enclosure might fail causing high controller/disk drive temperature.

3.2.2 Replacing Power Supply Fan Module

When replacing a failed power supply fan module (PSFM), please follow these steps:

1. Turn off the Power On/Off Switch of the failed PSFM.
2. Disconnect the power cord from the AC Inlet Plug of PSFM.
3. Loosen thumbscrews of the PSFM.
4. Use the handle to pull out the defective PSFM.
5. Before inserting the new PSFM, make sure the Power On/Off Switch is on "Off" state.
6. Insert and slide the new PSFM in until it clicks into place.

IMPORTANT: When the subsystem is online and a Power Supply fails, and the replacement Power Supply module is not yet available, the failed Power Supply Module can be replaced with the Plate Cover. This is to maintain proper airflow within the enclosure. (Refer to next section)

When replacing a failed component online, it is not recommended to remove the failed component for a long period of time; proper air flow within the enclosure might fail causing high controller/disk drive temperature.

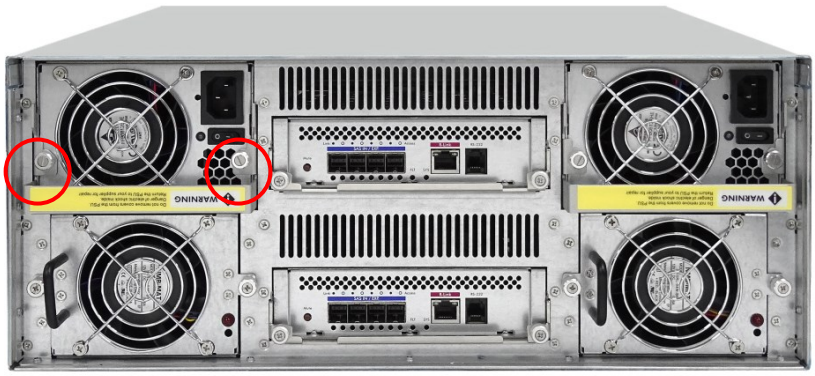
7. Connect the power cord to the AC Inlet Plug of PSFM.
8. Tighten the thumbscrews of the PSFM.
9. Turn on the Power On/Off Switch of the PSFM.

NOTE: After replacing the Power Supply Fan Module and turning on the Power On/Off Switch of the PSFM, the Power Supply will not power on immediately. The Fans in the PSFM will spin-up until the RPM becomes stable. When Fan RPM is already stable, the RAID controller will then power on the Power Supply. This process takes more or less 30 seconds. This safety measure helps prevent possible Power Supply overheating when the Fans cannot work.

3.2.2.1 Replacing Power Supply Fan Module with Blanking Plate

When replacing a failed power supply fan module (PSFM) with Blanking Plate, please follow these steps:

1. Turn off the Power On/Off Switch of the failed PSFM.
2. Disconnect the power cord from the AC Inlet Plug of PSFM.
3. Loosen thumbscrews of the failed PSFM.



4. Pull out the defective PSFM
5. Insert the PSFM Blanking Plate included in your package.

6. Tighten the screws of the Blanking Plate.